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10/697,106	10/31/2003	Yann Bodo	117653	9004

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EXAMINER	
KRASNIC, BERNARD	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/697,106	BODO ET AL.	
	Examiner	Art Unit	
	Bernard Krasnic	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 March 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *20070905*.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. The amendment filed 3/01/2007 have been entered and made of record.

2. The Applicant has included newly added claim 18.

3. In response to the amendments filed on 3/01/2007:

The "Objections to the title, abstract and specification" have been entered and therefore the Examiner withdraws the objections.

The "Objections to the Drawings" have been entered and therefore the Examiner withdraws the objections to the drawings.

The "Objections to the claims" have been entered and therefore the Examiner withdraws the objections to the claims.

The "Claim rejections under 35 U.S.C. 112, second paragraph" have been entered and therefore the Examiner withdraws the rejections under 35 U.S.C. 112, second paragraph.

4. Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection by the Applicant's amendments toward independent claim 1.

The Applicant alleges, "I. Vynne Does Not Disclose a Reference Space Divided Into a Plurality of Predetermined Portions" in pages 9-10, "II. One of Ordinary Skill

Would Not Have Been Motivated to Combine Vynne with Han" in pages 10-11, and "III. The Asserted Combination of Vynne and Han Does Not Disclose or Suggest Two Complementary Zones" in pages 11-12, and states respectively that the reference Vynne discloses all the limitations of claim 1 as the Examiner discussed in the Examiners original Non-Final Office Action except that Vynne does not disclose a reference space divided into a plurality of predetermined portions. However, the Examiner disagrees; similarly the Examiner disagrees that there was no motivation to combine Vynne with Han; and similarly the Examiner disagrees that Vynne combined with Han does not disclose two complementary zones. Therefore the Examiner will maintain the rejections using the same references. Further discussions will be presented below and in the rejections below.

5. Applicant's arguments filed 3/01/2007 have been fully considered but they are not persuasive.

The Applicant alleges, "I. Vynne Does Not Disclose a Reference Space Divided Into a Plurality of Predetermined Portions" in pages 9-10, and states respectively that the reference Vynne discloses all the limitations of claim 1 as the Examiner discussed in the Examiners original Non-Final Office Action except that Vynne does not disclose marking the coordinates of the selected motion vector in a reference space divided into a plurality of predetermined portions. However the Examiner disagrees, the Examiner referring to the rejection for claim 1 in the Examiners original Non-Final Office Action states that the step of marking the coordinates of the selected motion vector (V) in a

reference space divided into a plurality of predetermined portions may be found in Vynne (see Fig. 3.1A, 3.2, col. 7, lines 43-51). The Examiners interpretation of Vynne was marking the coordinates / (xi,yi) of the selected motion vector (V) / subset U(n)V(n) [V(n)U(n) is the subset of a set of motion vectors V(n), where V(n)={v1, v2, ..., vn}, where vi=(xi,yi), and where xi and yi are the x and y coordinate of the motion vector vi] in a reference space / frame(n) (312, see Fig. 3.1A) divided into a plurality of predetermined portions / predetermined m number of blocks (310, see Fig. 3.1A). Therefore Vynne (see Fig. 3.1A, 3.2, col. 7, lines 43-51) does disclose the limitation of a marking of the coordinates of the selected motion vector in a reference space divided into a plurality of predetermined portions and therefore the Examiner maintains the rejection.

The Applicant alleges, "II. One of Ordinary Skill Would Not Have Been Motivated to Combine Vynne with Han" in pages 10-11, and states respectively that one of ordinary skill would not have been motivated to combine Vynne with Han. However the Examiner disagrees, because it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Vynne's motion vector blocks using Han's teachings by including the two complementary zones with hierarchical successive levels of motion vectors in order to optimize the encoding by using this multi-scale motion data represented by a tree to eliminate fine scale motion data (see Han, col. 1, lines 60-61, col. 2, lines 12-15). In response to applicant's argument that Han is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem

with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the motivation does exist to combine Vynne with Han because both relate to having blocks in frames with motion vector information.

The Applicant alleges, "III. The Asserted Combination of Vynne and Han Does Not Disclose or Suggest Two Complementary Zones" in pages 11-12, and states respectively that Han does not disclose or suggest defining two complementary zones Z0 and Z1 in each portion, one of the two zones being situated inside the other one and that there is no motivation to combine Vynne with Han. However, the Examiner disagrees, because Han does disclose two complementary zones Z0 (16, see Fig. 1) and Z1 / (the area between 16 and 18 [the area between 16 and 18 if you can consider is the area of 18 minus the area of 16], see Fig. 1) in each portion / area or block (18, see Fig. 1), one of the two zones being situated inside the other one (area 16 is situated inside the area between 16 and 18 [the area between 16 and 18 if you can consider is the area of 18 minus the area of 16]). Therefore Han does disclose the limitation of defining two complementary zones Z0 and Z1 in each portion, one of the two zones being situated inside the other one and therefore the Examiner maintains the rejection. As to the argument that there is no motivation to combine Vynne with Han, the discussions have been discussed above.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vynne et al (US 5,960,081) in view of Han et al (US, 6,845,130 B1).

Re Claim 1: Vynne discloses a method of watermarking / embedding a digital signature (217) (see Fig. 2.2, Abstract, lines 1-2) a video signal by applying a watermarking function to motion vectors calculated by estimation of movement (see col. 8, lines 1-9) between images of the video signal, the method comprising the following steps of applying the watermarking function to at least some of the calculated motion vectors (see Abstract, lines 4-6, col. 8, lines 1-3); and generating the watermarked video signal by compensating movement with the aid of the watermarked motion vectors (see Abstract, lines 1-6, col. 8, lines 1-3), the watermarking function being applied with the aid of a binary marking key (217, 219) (see Fig. 2.2, Abstract, lines 13-16, col. 7, lines 51-64, col. 12, lines 1-12), each bit of which is associated with at least one selected motion vector (Abstract, lines 13-16, col. 7, lines 51-64), to apply the watermarking function, the method further comprises the following steps of marking the coordinates / (xi,yi) of the selected motion vector (V) / subset U(n)V(n) [V(n)U(n) is the subset of a set of motion vectors V(n), where V(n)={v1, v2, ..., vn}, where vi=(xi,yi), and where xi and yi are the x and y coordinate of the motion vector vi] in a reference space / frame(n) (312,

see Fig. 3.1A) divided into a plurality of predetermined portions / predetermined m number of blocks (310, see Fig. 3.1A) (see Fig. 3.1A, 3.2, col. 7, lines 43-51); and if the coordinates / (xi,yi) of the selected motion vector / U(n)V(n) are in the zone of the portion to which it belongs, of binary value which corresponds to the bit of the marking key (217, 219, see Fig. 2.2) with which the selected motion vector is associated (see col. 7, lines 48-51), not modifying the coordinates of the selected motion vector (if not necessary, there will be no modifications of either the x or y-coordinate of the motion vectors according to bitset S(i) where S(i) represents the signature, col. 7, lines 48-51, col. 8, lines 1-3); if the coordinates (xi,yi) of the selected motion vector / U(n)V(n) are not in the zone of the portion to which it belongs, of binary value which corresponds to the bit of the marking key / (217, 219, see Fig. 2.2) with which the selected motion vector is associated , modifying the coordinates of the selected motion vector (if necessary, there will be modifications on either the x or y-coordinate of the motion vectors according to bitset S(i) where S(i) represents the signature, see col. 7, lines 48-51, col. 8, lines 1-3) so that it is in the zone, of binary value which corresponds to the bit of the marking key with which the selected motion vector is associated (see col. 7, lines 48-51).

However Vynne fails to disclose or fairly suggest defining two complementary zones Z0 and Z1 in each portion, one of the two zones being situated inside the other one.

Han discloses two complementary zones Z0 (16, see Fig. 1) and Z1 / (the area between 16 and 18 [the area between 16 and 18 if you can consider is the area of 18

minus the area of 16], see Fig. 1) in each portion / area or block (18, see Fig. 1), one of the two zones being situated inside the other one (area 16 is situated inside the area between 16 and 18 [the area between 16 and 18 if you can consider is the area of 18 minus the area of 16]), and assigning a binary value (taught by Vynne above) to each of the two zones.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Vynne's motion vector blocks using Han's teachings by including the two complementary zones with hierarchical successive levels of motion vectors in order to optimize the encoding by using this multi-scale motion data represented by a tree to eliminate fine scale motion data (see Han, col. 1, lines 60-61, col. 2, lines 12-15).

Re Claim 2: Han further discloses the reference space is a reference grid (14) including blocks / area or blocks (18) with predefined dimensions (see col. 1, lines 40-41), each block including first (the area 16) and second zones (the area between 16 and 18 [the area between 16 and 18 if you can consider is the area of 18 minus the area of 16]).

Re Claim 3: Han further discloses calculating a hierarchical plurality of successive levels (Level 0, Level 1, Level 2) of motion vectors (see Fig. 5, 6, col. 3, lines 45-47), the motion vectors of a given level each being associated with a plurality of motion vectors of the next lower level (see col. 3, lines 20-23); selecting at least some of the motion vectors belonging to the highest level (taught by Vynne above in claim 1); applying the

watermarking function to each selected motion vector, leading to calculating a modification parameter for said motion vector (taught by Vynne above in claim 1); and applying the modification parameter of the selected motion vector to the motion vectors of a lower level (it would have been obvious to one of ordinary skill in the art at the time the invention was made to have such a feature because of the fact that applying the modification to the lower levels would increase the difficulty of removing the embedded digital signature even further) associated with said motion vector.

Re Claim 4: Han further discloses the motion vectors of a given level are each equal to the average of the motion vectors of the next lower level (see Fig. 6, col. 3, lines 20-23) with which they are associated.

Re Claim 5: Han further discloses calculating a hierarchy of two successive levels of motion vectors, each motion vector of the higher level being associated with four motion vectors of the lower level (see Fig. 6, col. 3, lines 20-23).

Re Claim 6: Han further discloses the first (16, see Fig. 1) and second (the area between 16 and 18 [the area between 16 and 18 if you can consider is the area of 18 minus the area of 16], see Fig. 1) zones have substantially equal areas (see Fig. 1, the two zones 16 and the area between 16 and 18, have substantially equal areas as long as 18 is adjusted by the needed amount which it is capable of doing, col. 1, lines 40-41).

Re Claim 7: Han further discloses a sub-block (16) centered inside the block (18) is defined in each block of the reference grid (14), the first zone being defined by the interior of the sub-block (the area of 16) and the second zone (the area between 16 and 18 [the area between 16 and 18 if you can consider is the area of 18 minus the area of 16], see Fig. 1) being the zone in the block complementary to the first zone.

Re Claim 8: Han further discloses the blocks (18) and sub-blocks (16) of the reference grid (14) are rectangular (it would have been obvious to one of ordinary skill in the art at the time the invention was made to have such a feature because a rectangle is respectively a square as is seen in Fig. 1).

Re Claim 11: Vynne further discloses each bit of the binary marking key is associated with a plurality of selected motion vectors (see Fig. 2.2, Abstract, lines 13-15, col. 7, lines 41-59, col. 11, lines 50-67, col. 12, lines 1-12).

Re Claim 12: Vynne further disclose some of the bits of the binary marking key are associated with motion vectors calculated by motion estimation between two images of the video signal (see col. 7, lines 43-51), and wherein at least one other portion of the bits of the binary marking key is associated with motion vectors calculated by motion estimation between at least two other images of the video signal (col. 14, lines 60-63). Although Vynne fails to specifically disclose the limitation of using at least two other images for part of the binary marking key, it would have been obvious to one of ordinary

skill in the art at the time the invention was made to have such a feature because of the fact that it increases the difficulty of removing the embedded digital signature even further.

Re Claim 13: Vynne further discloses a device (210, 700, 710) for watermarking a video signal, the device (see Fig. 2.2, 7.1, col. 2, lines 12-22, see col. 10, lines 11-12) including means for implementing a method according to claim 1.

The limitation, as recited in claim 13, line 2, "means for implementing", invokes 35 USC 112, 6th paragraph.

Re Claim 14: Vynne further discloses a computer readable data medium (700, 710), including means for storing a video signal watermarked with the aid of a method according to claim 1 (see Fig. 7.1, col. 10, lines 11-12).

The limitation, as recited in claim 14, lines 1-2, "means for storing", invokes 35 USC 112, 6th paragraph.

Re Claim 15: Vynne further discloses a method of extracting watermarking (240) (see Fig. 2.3) from a video signal watermarked by applying a method according to claim 1, which extraction method comprises applying a function for extracting the binary marking key (228, 229) (see Fig. 2.3) comprising selecting the watermarked vectors (see col. 8, lines 10-13, Abstract, lines 13-16, col. 7, lines 51-64); marking the coordinates of each watermarked motion vector in the reference space (see col. 8, lines 10-13, Fig. 3.1A,

3.2, col. 7, lines 43-51); and assigning the binary value of the zone in which the watermarked vector is situated to the bit of the marking key with which the selected motion vector is associated (see col. 8, lines 10-13, Fig. 2.2, Abstract, lines 13-16, col. 7, lines 51-64, col. 12, lines 1-12). This claim is similar to claim 1 with the exception it is respectively opposite in that it is getting the embedded signature instead of actually embedding the signature (see Fig. 2.3, col. 8, lines 10-13).

Re Claim 16: Han further discloses calculating a hierarchical plurality of successive levels (Level 0, Level 1, Level 2) of motion vectors (see Fig. 5, 6, col. 3, lines 45-47), the motion vectors of a given level each being associated with a plurality of motion vectors of the next lower level (see col. 3, lines 20-23); selecting at least some of the motion vectors belonging to the highest level (taught by Vynne above in claim 1); applying the watermarking function to each selected motion vector, leading to calculating a modification parameter for said motion vector (taught by Vynne above in claim 1); and applying the modification parameter of the selected motion vector to the motion vectors of a lower level (it would have been obvious to one of ordinary skill in the art at the time the invention was made to have such a feature because of the fact that applying the modification to the lower levels would increase the difficulty of removing the embedded digital signature even further) associated with said motion vector; extracting the watermarked motion vectors associated with said motion vector (taught by Vynne above in claim 15); calculating an average vector equal to the average (see Fig. 6, col. 3, lines 20-23, respectively the same as in claim 4 with the exception that the average is taken

after the signature has been applied and removed) of the watermarked motion vectors associated with said motion vector; and applying the marking key extraction function to the calculated average vector (it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the marking key extraction function to the average vector instead of the vector taught by Vynne because of the fact that creating these average vectors would increase the difficulty of removing the embedded digital signature even further).

Re Claim 17: Vynne further discloses a device (700, 710) for extracting the watermarking from a video signal, including means (see Fig. 7.1, 10A, 10B, col. 8, lines 10-13, col. 10, lines 11-12) for implementing a method according to claim 15.

The limitation, as recited in claim 17, line 2, "means for implementing", invokes 35 USC 112, 6th paragraph.

Re Claims 9-10 and 18 respectively: Although Vynne and Han fail to specifically disclose the limitation of having a modification, if any, applied to the selected motion, vector (V) is a weighted symmetry, weighted central symmetry, or a weighted axial symmetry relative to one of the sides of the sub-block, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have such a feature because of the fact that applying the modification as taught by Vynne (see col. 7, lines 48-51, col. 8, lines 1-3) in this type of weighted symmetric manner is much simpler and

it gives the ability to increase the difficulty of removing the embedded digital signature even further.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kutter et al discloses a method for marking a compressed digital video signal; Dugelay discloses watermarking video, hierarchical embedding in motion vectors.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Krasnic whose telephone number is (571) 270-1357. The examiner can normally be reached on Mon-Thur 8:00am-4:00pm and every other Friday 8:00am-3:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Bernard Krasnic
May 8, 2007

JINGGE WU
SUPERVISORY PATENT EXAMINER